

UL TEST REPORT AND PROCEDURE

Standard:	UL 60950-1, 2nd Edition, 2011-12-19 (Information Technology Equipment - Safety - Part 1: General Requirements) CSA C22.2 No. 60950-1-07, 2nd Edition, 2011-12 (Information Technology Equipment - Safety - Part 1: General Requirements)
Certification Type:	Component Recognition
CCN:	QQGQ2, QQGQ8 (Power Supplies for Information Technology Equipment Including Electrical Business Equipment)
Product:	Power Supply, Built-In AC/DC
Model:	TLP150X-96S12, TLP150X-96S24, TLP150X-96S36, TLP150X-96S48, TLP150X-99S12, TLP150X-99S24, TLP150X-99S48, TLP150N-96S12N01J and TLP150N-99S12F02J where X is any alphanumeric character or blank that represents customer specific options that do not affect safety. Model numbers may be followed by alphanumeric characters that represent customer specific options that do not affect safety.
Rating:	<p>Input Ratings: 100-240 Vac, 2.5 A, 47-63 Hz or 100-132 Vac, 2.5 A, 47-440 Hz or 100-240 Vac, 1.3-0.6 A, 50/60 Hz (for Model TLP150N-96S12N01J only) 100-240 Vac, 2.5A, 50/60 Hz or 115 Vac, 2.5A, 400Hz (for Model TLP150N-99S12F02J only)</p> <p>Output Ratings: TLP150X-96S12 and TLP150X-99S12 12Vdc/12.5A, max. 150 watts with 200 LFM Fan 12Vdc/8.33A, max 100 watts Convection Cooled</p> <p>TLP150X-96S24 and TLP150X-99S24 24Vdc/6.25A, max. 150 watts with 200 LFM Fan 24Vdc/4.15A, max. 100 watts Convection Cooled</p> <p>TLP150X-96S48 and TLP150X-99S48 48Vdc/3.20A, max. 150 watts with 200 LFM Fan 48Vdc/2.10A, max. 100 watts Convection Cooled</p> <p>TLP150X-96S36 36Vdc/4.2A, max. 150 watts with 200 LFM Fan 36Vdc/2.77A, max. 100 watts with Convection Cooled</p> <p>TLP150N-99S12F02J +12Vdc/12.5A max.; +5Vsb/1A max., 150 watts with 400LFM Fan at 50°C 75 watts with 400LFM Fan at 70°C</p>
Applicant Name and Address:	ASTECH INTERNATIONAL LTD 16TH FL LU PLAZA

Issue Date: 2012-10-03
2013-07-15

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Report Reference #

E186249-A185-UL

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This is to certify that representative samples of the products covered by this Test Report have been investigated in accordance with the above referenced Standards. The products have been found to comply with the requirements covering the category and the products are judged to be eligible for Follow-Up Service under the indicated Test Procedure. The manufacturer is authorized to use the UL Mark on such products which comply with this Test Report and any other applicable requirements of UL LLC ('UL') in accordance with the Follow-Up Service Agreement. Only those products which properly bear the UL Mark are considered as being covered by UL's Follow-Up Service under the indicated Test Procedure.

The applicant is authorized to reproduce the referenced Test Report provided it is reproduced in its entirety.

UL authorizes the applicant to reproduce the latest pages of the referenced Test Report consisting of the first page of the Specific Technical Criteria through to the end of the Conditions of Acceptability.

Any information and documentation involving UL Mark services are provided on behalf of UL LLC (UL) or any authorized licensee of UL.

Prepared by: Tony Yeung

Reviewed by: Henry Ho

Supporting Documentation

The following documents located at the beginning of this Procedure supplement the requirements of this Test Report:

- A. Authorization - The Authorization page may include additional Factory Identification Code markings.
- B. Generic Inspection Instructions -
 - i. Part AC details important information which may be applicable to products covered by this Procedure. Products described in this Test Report must comply with any applicable items listed unless otherwise stated in the body of this Test Report.
 - ii. Part AE details any requirements which may be applicable to all products covered by this Procedure. Products described in this Test Report must comply with any applicable items listed unless otherwise stated in the body of each Test Report.
 - iii. Part AF details the requirements for the UL Certification Mark which is not controlled by the technical standard used to investigate these products. Products are permitted to bear only the Certification Mark(s) corresponding to the countries for which it is certified, as indicated in each Test Report.

Product Description

Component type AC/DC switching power supply for building in.

Maximum V, A, VA

Output	V	A	VA
12V	13.2	15.6	168.704
24V	24	6.25	150
36V	35.96	5.98	185.3
48V	52.8	4.74	182

NOTES:

- 1) X represents an alphanumeric character that represent customer specific option that do not affect safety.
- 2) Model numbers may be followed by alphanumeric characters that represent customer specific options that do not affect safety.
- 3) The (fan) is 200 LFM forced air while 400 LFM forced air for TLP150N-99S12F02J only.
- 4) 100W max natural convection except for TLP150N-99S12F02J.
- 5) 150W max with forced air at 50°C. 75W max with forced air at 70°C for TLP150N-99S12F02J only
- 6) The maximum operating ambient temperature is 50°C.
- 7) +12V. 0.5A Fan output (available for TLP150X-96S36)

Model Differences

Model TLP150N-99S12F02J are identical to previous tested model TLP150X series except minor PCB layout is changed. For the mains fuse was changed from the old box type to glass type so minor movement of layout to insert the glass type fuse. C34, C35, C40 was deleted. Refer to enclosure - miscellaneous ID7-10.

All models are identical except for model number, input / output ratings, number of turns in transformer's output winding and minor secondary component changes.

Technical Considerations

- Equipment mobility : for building-in
- Connection to the mains : Provided with internal connections for factory wiring only
- Operating condition : continuous
- Access location : To be considered in end system
- Over voltage category (OVC) : OVC II
- Mains supply tolerance (%) or absolute mains supply values : +10%, -10%
- Tested for IT power systems : No
- IT testing, phase-phase voltage (V) : N/A
- Class of equipment : Class I (earthed)
- Considered current rating of protective device as part of the building installation (A) : See cover page
- Pollution degree (PD) : PD 2
- IP protection class : IP X0
- Altitude of operation (m) : up to 3048 m
- Altitude of test laboratory (m) : < = 500 m
- Mass of equipment (kg) : < 18
- The product was submitted and evaluated for use at the maximum ambient temperature (T_{ma}) permitted by the manufacturer's specification of: 50°C at full rated load without cover, 40°C at full rated load with cover and 70°C at derated load of 2.5% per degree above 50°C (without cover) / 40°C (with cover) with 200 LFM or 400 LFM (for TLP150N-99S12F02J only) forced air cooling.
- The means of connection to the mains supply is: Provided with internal connections for factory wiring only.
- The product is intended for use on the following power systems: TN
- The product was investigated to the following additional standards: EN 60950-1:2006+ A11:2009+ A1:2010 + A12:2011, (which includes all European national differences, including those specified in this test report),.
- The models TLP150X-99S12 and TLP150X-99S24 have also been investigated to UL 60601-1 clause 19, 20, 42, 57.6, 57.9 and 57.10. This investigation was based on a TUV Certificate No. B 11 11 51485 985 under EN 60601-1:2006 (3rd ed.). These models are not for direct patient contact and all outputs are not Medical SELV.
- The power supply was evaluated for use at an altitude of up to 3,048 meters above sea level and complies with the Creepage and Clearance requirements at that height. An additional evaluation may be necessary if installed in an application above 3,048 meters above sea level. Altitude factor of 1.15.

Engineering Conditions of Acceptability

For use only in or with complete equipment where the acceptability of the combination is determined by UL LLC. When installed in an end-product, consideration must be given to the following:

- The end-product Electric Strength Test is to be based upon a maximum working voltage of: 240 Vrms, 425 Vpk, Primary-Earthed Dead Metal: 240 Vrms, 425 Vpk. For Model TLP150X-96S36, the rms and the peak voltage of the unit is Primary-SELV: 261 Vrms, 530 Vpk, Primary-Earthed Dead Metal: 226 Vrms, 440 Vpk. For Model TLP150N-99S12F02J, the rms and the peak voltage of the unit is Primary-SELV: 396.1 Vrms, 539 Vpk, Primary-Earthed Dead Metal: 396.5 Vrms, 539 Vpk.,
- The following secondary output circuits are SELV: All (Not Medical SELV)

- The following secondary output circuits are at non-hazardous energy levels: +5Vsb, +12V
- The power supply terminals and/or connectors are: Suitable for factory wiring only.,
- The maximum investigated branch circuit rating is: 20 A
- The investigated Pollution Degree is: 2
- Proper bonding to the end-product main protective earthing termination is: Required
- The following magnetic devices (e.g. transformers or inductor) are provided with an OBJY2 insulation system with the indicated rating greater than Class A (105°C): T2 and T301 are Class F,
- The following end-product enclosures are required: Fire, Electrical, Heat
- The maximum continuous power supply output (Watts) relied on forced air cooling from: 200 LFM forced air / 400 LFM (for TLP150N-99S12F02J only).,
- The following components are rated based on their RTI: All inductors (minimum 130°C)
- The following caution marking or its equivalent should be provided in the end use product application: CAUTION. Double pole/neutral fusing.
- No flames or molten, dripping materials are emitted by the power supply under any fault condition and in any orientation